

Case Report

GASTROCUTANEOUS FISTULA: A CHALLENGE FOR THE GASTROINTESTINAL SURGEON

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Abstract. Gastrocutaneous fistulae can occur spontaneously or in the postoperative period. Postoperative fistulae represent more than 90% of all intestinal fistulae and they are always related to some of the main complications of surgery of the alimentary tract. We report a case of GF following a major operative procedure treated at our hospital. We emphasize the diagnostic tools and treatment options for this surgical complication, which, if left unaddressed, could pose life-threatening risks. Conservative management of patients with gastrocutaneous fistula is a crucial period during which careful individual control of each patient's nutritional status and replacement of fluid and electrolyte losses through high-output fistula, as well as prevention of sepsis and exclusion of the stomach from the digestive passage, can result in reduced morbidity and mortality from this complex problem. The decision regarding the timing of surgical intervention must be aligned with achieving optimal results of conservative management, which is a winning approach combination.

Key words: gastrocutaneous fistula, gastrojejunostomy, enteral nutrition.

Introduction

A fistula is an abnormal passage or connection between two parts of the digestive system or between the skin and an internal organ. The secretions of the gastrointestinal tract (GIT) have been extensively studied, detailing their electrolyte composition and volume depending on the originating segment. Individuals with gastrointestinal (GI) fistulas may exhibit severe dehydration, electrolyte disturbances, and malnutrition [1].

Digestive fistulas can be categorized as internal when communicating with other parts of the GIT or neighboring organs. These internal fistulas may exhibit no or only mild symptoms, such as recurrent infections. Conversely, external fistulas occur when the abnormal tract comes into contact with the outer surface of the body, typically

the skin, often following surgical procedures. Postoperative fistulas represent more than 90% of all intestinal fistulas and are consistently associated with significant complications of the digestive system [2].

Gastrocutaneous fistula (GCF) is a relatively uncommon yet significant surgical complication that has been relatively underexplored in recent medical literature. GCF denotes a fistulous connection between the stomach and the skin. It is characterized by an internal orifice (gastric outlet), an external orifice (cutaneous outlet), and a tract (typically lined with epithelium). GCF occur in approximately 0.5–3.9% of normal-weight patients undergoing gastric surgery [3].

We report a case of GF following a major operative procedure treated at our hospital. We emphasize the diagnostic tools and treatment options for this surgical

complication, which, if left unaddressed, could pose life-threatening risks.

Case Report

A 55-year-old male patient had a medical history with multiple abdominal surgeries at the surgical department of the regional medical center, with a chronological review as follows: 24 years ago, suturing of a gastric ulcer perforation and diffuse peritonitis was performed; 16 years ago, a gastrojejunostomy anastomosis was created due to pyloric stenosis using the anterior antecolic method by Wölfler, along with a latero-lateral jejunajejunal anastomosis by Braun's method, and in the same year, he experienced acute pancreatitis treated conservatively; 15 years ago, suturing and omentoplasty of a duodenal bulb ulcer perforation with associated diffuse acute peritonitis was performed, and in the same year, he experienced intestinal subocclusion successfully treated with conservative methods; 9 years ago, suturing of the anterior antecolic gastrojejunostomy anastomosis due to perforation at the anastomosis line (first GJA perforation) and simultaneous resection of the jejunum intestine with termino-terminal anastomosis due to gangrene with perforation of the jejunum intestine caused by torsion of the jejunal limb with accompanying diffuse acute peritonitis; 3 years ago, a double perforation at the anterior antecolic gastrojejunostomy anastomosis line (second GJA perforation) was treated by resecting the anterior antecolic gastrojejunostomy anastomosis, creating a termino-terminal jejunum intestine anastomosis involved in the creation of GJA, and creating a new anterior antecolic gastrojejunostomy anastomosis and adhesiolysis of intra-abdominal adhesions.

The patient was admitted to the University Clinical Center Niš, Clinic for Digestive Surgery, due to the appearance of a large fistulous opening in the epigastric region at the site of the previous surgical incision with active inflammation and maceration of the surrounding skin, from which fluids reminiscent of gastric content were draining. The patient underwent a CT scan of the abdomen, upper GI series (Figure 2), and contrast radiography of the upper GI tract using non-ionic iodine contrast agent Ultravist 500 (Figure 3). Both diagnostic procedures revealed leakage of gastric fluid from the lumen of the stomach into the area of the created anterior antecolic gastrojejunostomy (third GJA perforation), with a patent fistulous tract about 15 mm in length, 2 mm wide, sharp wavy contour, directed obliquely downwards towards the anterior abdominal wall with an opening in the skin in the epigastric region. The patient's gastrocutaneous fistula on admission to the hospital presented as a high-output fistula with daily drainage of over 500 ml of gastric content. Shortly after admission, the patient was transferred to the Intensive Care Unit, Clinic for Anesthesiology, Reanimation and Intensive Treatment of the University Clinical Center in Niš. The primary conservative treatment of the patient included discontinuation of oral intake, placement of a nasogastric tube for gastric



Fig. 1 Opening of the gastrocutaneous fistula (arrow) with cellulitis of the surrounding skin and defect of the anterior abdominal wall

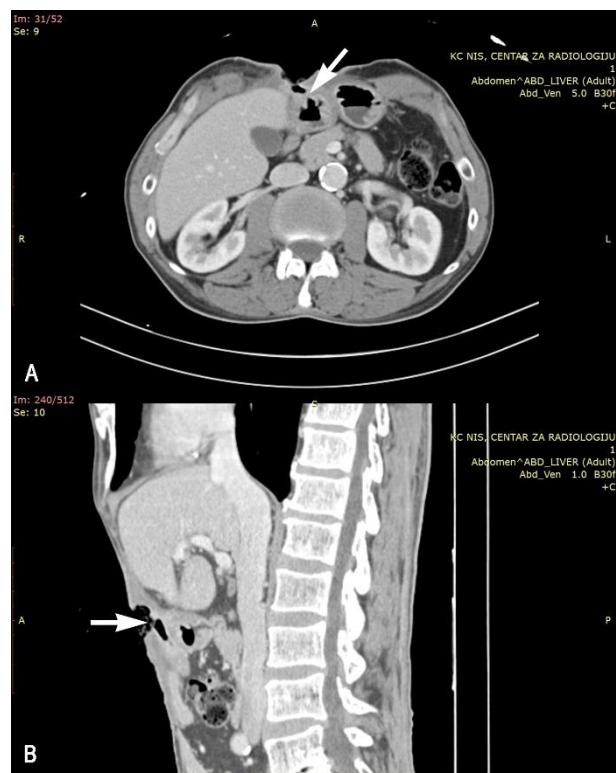


Fig. 2 Gastrocutaneous fistula: A) transverse view CT scan of the abdomen upper GI series shows the fistulous tract (arrow), B) sagittal view CT scan of the abdomen upper GI series shows the fistulous opening (arrow)

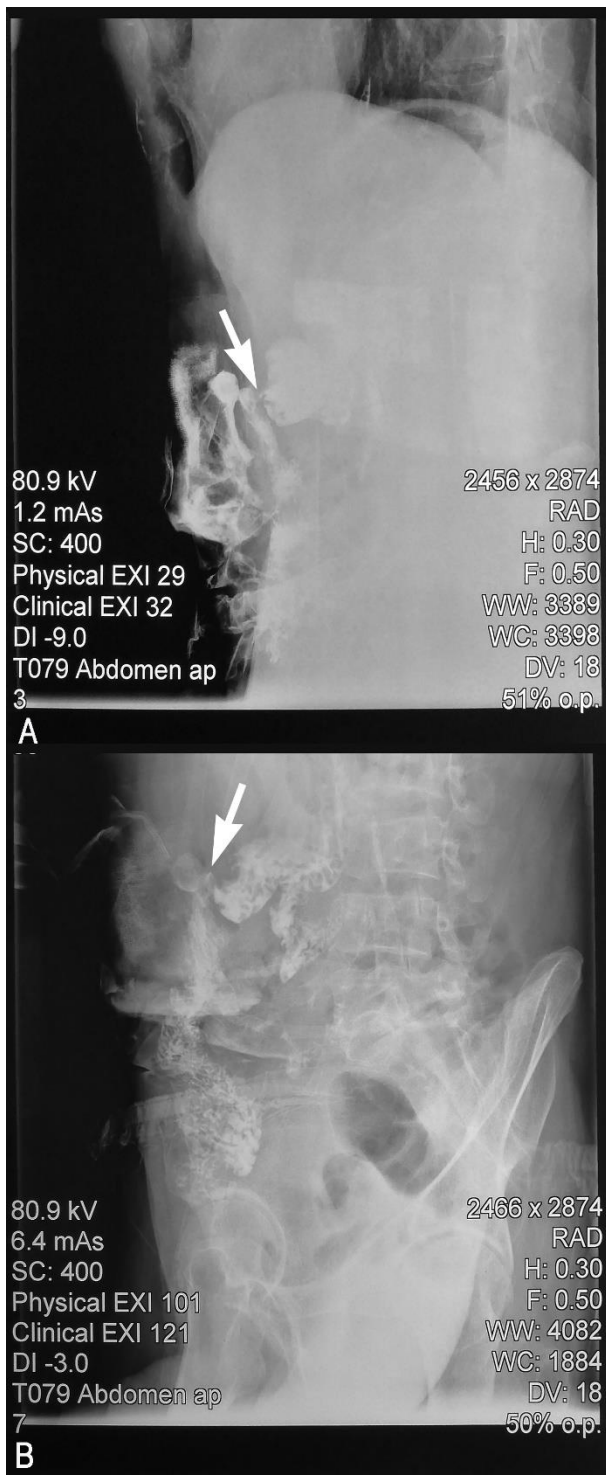


Fig. 3 Gastrocutaneous fistula: A) lateral view contrast radiograph upper GI tract, shows the fistulous tract (arrow), B) angled view contrast radiograph upper GI tract, shows the fistulous opening (arrow)

content evacuation, daily monitoring of content drainage from the fistulous opening, as well as monitoring of laboratory analyses, hemodynamic parameters, and daily fluid and electrolyte balance. Microbiological local and general analyses were sampled, dual antimicrobial therapy and proton pump inhibitors (PPI) were prescribed.

Laboratory analyses on admission indicated hemoconcentration, uremia, and hypochloremia, and a decrease in creatinine clearance to 34 ml/min, plasma osmolality of 304 mOsm/kgH₂O, and urine osmolality of 1050 mOsm/L. The nutritional status assessment revealed a body mass index (BMI) of 18.6 kg/m², Nutritional Risk Screening (NRS) score of 4, and transferrin concentration of 1.07 g/L. Parenteral nutrition was gradually introduced to meet caloric and protein goals over 7 days of treatment, considering the high risk of refeeding syndrome development. The caloric goal was calculated as the product of corrected body weight and 30 kcal/kg caloric goal, while the protein goal was primarily calculated as 1.3 g/kg according to European guidelines for critically ill patients until the final stage of treatment after the second surgical intervention at the University Clinical Center in Niš when it was increased to 2 g/kg. Along with therapeutic optimization of general, fluid-electrolyte, and nutritional status of the patient, great attention was directed towards improving wound care and surrounding skin. Gradual healing and narrowing of the fistulous opening were observed in response to conservative treatment. At one point, control of drainage was achieved conservatively by placing drainage catheters in the efferent and afferent limbs of the jejunum intestine (Figure 4).



Fig 4 Attempt of conservative treatment of gastrocutaneous fistula by controlling drainage with placement of drainage catheters in the efferent and afferent limbs of the jejunum intestine

On the 14th day of parenteral nutrition initiation, or the 7th day of medical nutritional therapy optimization, considering the patient's previous medical history and

persistent gastrocutaneous fistula despite conservative treatment, it was decided to perform the surgical intervention. The patient underwent an exploratory laparotomy, suturing of the gastrojejunostomy anastomosis perforation using a two-layer suture technique with omentoplasty, creation of a nutritional jejunostomy by Witzel's method, and repair of the laparotomy wound defect using Vetrofil Special Suture Set. From the second postoperative day, minimal enteral nutrition was initiated via the nutritional jejunostomy, and parenteral nutrition continued. This period of patient treatment was characterized by careful monitoring of upper GIT dysfunction. Enteral intake through the nutritional jejunostomy was gradually increased while reducing the proportion of parenteral nutrition. Throughout this period, the previously established caloric and protein target intakes were met. Ten days after the surgical intervention, successful healing of the gastrocutaneous fistula was achieved, confirmed by contrast radiography of the upper GIT (Figure 5). Due to the occurrence of ileus caused by strangulation of the distal limb of the jejunum intestine and numerous intra-abdominal adhesions to the jejunum, ileum, and colon, on the 11th postoperative day, exploratory laparotomy was performed, intestinal jejunum de-strangulation and extensive adhesiolysis were conducted, the nutritional jejunostomy was removed, and the laparotomy wound was closed using Vetrofil Special Suture Set. The perioperative period preceding the second surgical intervention was characterized by a significant inflammatory syndrome and the use of vasoconstrictor support for 48 hours postoperatively. The patient received parenteral nutrition with the gradual introduction of oral feeding after a slow recovery of upper GIT passage. Gradual resolution of the inflammatory syndrome led to definitive patient recovery, and the patient was discharged on the 12th postoperative day after the second surgical intervention for home care.

Discussion

GCF is a rare yet significant surgical complication, posing a challenging management dilemma for surgeons [2]. The pathogenesis underlying the formation of GCF is diverse and dependent on the specific underlying causes. In cases where gastric fistulas arise from iatrogenic gastric injury or disruption of gastric suture lines, the mechanism appears to involve vascular necrosis. This phenomenon was initially documented by Rutter in 1953 and subsequently by Spencer in 1956. Studies investigating the blood supply to the stomach have revealed that either the left gastric artery or gastroepiploic artery alone is sufficient to maintain circulation to a gastric stump [4]. Prolonged use of a gastrostomy tube is another common contributing factor, often affecting the pediatric population [2]. The typical timeframe for identifying GCF postoperatively is around day 21. Patients might experience symptoms such as abdominal pain, tenderness, fever, or an elevated white blood cell count. Initially, the wound may exhibit a cellulitic appearance, which can advance

to increased drainage or the formation of an abscess. Typically, within 24 to 48 hours of observing changes in the wound's skin, patients may demonstrate the presence of enteric contents in the wound or on the dressing. It's crucial for the surgeon to attend this study alongside the radiologist. The insights provided by this straightforward test are often easier for the surgeon to interpret, especially considering that the majority of these patients present after surgery [1].

The accurate diagnosis of this critical condition is best achieved through upper gastrointestinal (GI) contrast radiography. The preferred agent is gastrographin, as opposed to oral blue dye administration, as the visualization of dye in the drainage merely confirms the presence of the fistula without delineating its tract and precise location [4, 5]. Additionally, an abdominal CT scan serves as another valuable diagnostic modality, particularly in postoperative patients presenting with fever and clinical deterioration, where there is suspicion of abdominal fluid collection, abscess, or other serious complications [5]. The primary management approach for these fistulas mirrors that of other GIT fistulas. This includes ensuring proper drainage, replenishing necessary fluids and electrolytes, administering targeted antibiotic therapy, and relieving GIT pressure, which collectively constitutes the preferred treatment strategy [3].

The conventional approach to managing gastrointestinal fistulas (GIF) involves surgical intervention coupled with extended nutritional support. Therefore, it is crucial to identify optimal nutritional strategies to adequately support patients, potentially leading to favorable outcomes. GIF, particularly those affecting the upper GIT and involving leakage, present significant challenges in recovery. Studies have indicated that Total Parenteral Nutrition (TPN) can significantly enhance the prognosis of patients with GIF by promoting spontaneous closure rates and enhancing the nutritional status of individuals necessitating repeated surgical interventions [5]. Pearlstein et al. observed spontaneous closure of gastrocutaneous fistulas in 70% of patients with conservative measures [3]. Kobak et al. reported a 53% closure rate of fistulas following tract cauterization with silver nitrate and the administration of H₂ antagonists [6]. Deruyter et al. documented two cases of successful fistula closure using omeprazole and total parenteral nutrition [7]. The eventual prognosis for patients with GCF varies considerably. One study reported complete healing without surgical intervention, accompanied by apparent low morbidity and no fatalities. In contrast, another study detailed patients experiencing this complication post-splenectomy, among whom mortality occurred due to GCF. The individuals who did not survive underwent surgical closure of their fistulas [3].

Conclusion

Conservative management of patients with gastrocutaneous fistula is a crucial period during which careful indi-

vidual control of each patient's nutritional status and replacement of fluid and electrolyte losses through high-output fistula, as well as prevention of sepsis and exclusion of the stomach from the digestive passage, can result in reduced morbidity and mortality from this complex

problem. The decision regarding the timing of surgical intervention must be aligned with achieving optimal results of conservative management, which is a winning approach combination.

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